

5 What is claimed is:

1. An image sensor fabricated on a substrate comprising:
 a CMOS image sensor for defining an image signal photoelectrically
 converted in response to received light;
 an array of non-volatile memory cells for receiving and storing the image
 10 signal, wherein each memory cell stores a trapped charge; and
 a level of protective material fabricated over the array of non-volatile
 memory cells for blocking the light received by the CMOS imager so that the
 trapped charged is not erased from exposure to the light.
- 15 2. The image sensor of claim 1 wherein each memory cell is a field effect
 transistor with a floating gate.
3. The image sensor of claim 1 wherein the level of protective material is
 polyamide.
- 20 4. The image sensor of claim 1 wherein the level of protective material is
 fabricated as part of the CMOS imager.
5. The image sensor of claim 1 wherein the level of protective material is a
 25 layer of metal fabricated as an interconnect for electrically connecting the CMOS
 imager and other circuits on the substrate.
6. The image sensor of claim 1 wherein the CMOS imager comprises an active
 pixel array.
- 30 7. The image sensor of claim 1 wherein the CMOS imager comprises a passive
 pixel array.

366733-03992169

- 5 8. An image sensor on an integrated circuit comprising:
 a CMOS imager for defining an image in response to received light;
 a non-volatile memory unit for storing the image, wherein the non-volatile
 memory unit is fabricated adjacent to the CMOS imager; and
 a level of protective material fabricated over the non-volatile memory for
 10 blocking the light received by the CMOS imager.
9. The image sensor of claim 8 wherein the level of protective material is
 fabricated as part of the CMOS imager.
- 15 10. The image sensor of claim 8 further comprising a micro-controller for
 controlling transfer of the image from the CMOS imager to the non-volatile memory
 unit.
11. The image sensor of claim 10 wherein the non-volatile memory stores
 20 program code information for controlling the microcontroller.
12. The image sensor of claim 8 further comprising a digital signal processor for
 receiving and processing the image from the CMOS imager.
- 25 13. The image sensor of claim 8 wherein the level of protective material is a
 layer of metal.
14. The image sensor of claim 8 wherein the layer of metal is fabricated as an
 interconnect for electrically connecting the CMOS imager and other circuits on the
 30 substrate.
15. An image sensor on an integrated circuit comprising:
 a CMOS imager for defining an image in response to received light;
 a microcontroller for controlling the CMOS imager;

SECRET

- 5 a non-volatile memory unit fabricated adjacent to the CMOS imager for storing program code or data; and
- 114 a level of protective material fabricated over the non-volatile memory for blocking the light received by the CMOS imager.

10 16. The image sensor of claim 15 wherein the non-volatile memory receives and stores the image.

15 17. The image sensor of claim 15 wherein the level of protective material is metal fabricated as an interconnect layer for electrically connecting other circuits on the single integrated circuit.

18. The image sensor of claim 15 further comprising a digital signal processor for receiving and processing the image from the CMOS imager.

Sub 15 19. A digital camera fabricated on a single integrated circuit comprising:

a CMOS image sensor for defining an analog image signal photoelectrically converted in response to received light;

an analog to digital convertor for receiving and converting the analog image signal into a digital image signal;

25 a frame memory for recording the digital image signal;

a data compression/decompression unit for compressing the digital image signal provided by the frame memory;

a non-volatile memory unit for receiving the compressed digital image signal, wherein a layer of protective material is fabricated over the non-volatile

30 memory unit for blocking the light received by the CMOS imager; and

a microcontroller for controlling the exchange of the digital image signal between the frame memory and the non-volatile memory unit.

20. The digital camera of claim 19 further comprising:

5 a digital signal processor for receiving and processing the digital image signal from the frame memory;

a digital to analog convertor for converting the digital image signal to an analog image signal, wherein the digital signal processor and the digital to analog convertor are fabricated on the single integrated circuit; and

10 an electronic view finder for viewing the image.

Sub 21. The digital camera of claim 19 wherein the non-volatile memory unit is fabricated adjacent to the CMOS imager sensor.

15 22. The digital camera of claim 19 wherein the protective layer is fabricated as part of the CMOS imager sensor.

23. The digital camera of claim 19 wherein the non-volatile memory unit stores program code information for controlling the microcontroller.

20 24. The digital camera of claim 19 wherein the protective layer is fabricated as a metal interconnect layer for electrically connecting circuits on the integrated circuit.

Sub 25. 25. The digital camera of claim 19 wherein the CMOS imager comprises an active pixel array.

26. The digital camera of claim 19 wherein the CMOS imager comprises a passive pixel array.

30 27. A method of fabricating a CMOS imager on an integrated circuit with non-volatile memory comprising the steps of:

fabricating an array of non-volatile memory cells;

fabricating a light blocking layer over the non-volatile memory cells; and

A7 and
fabricating the CMOS imager for defining an image in response to received light.

B
28. The method of claim 27 wherein the light blocking layer is a metal layer used as an interconnect for electrically connecting other circuits on the integrated circuit.